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(71) Applicant *(for all designated States except US)*: GLYZINC PHARMACEUTICALS LIMITED [AU/AU]; c/o Bowman Manser & Assoc. Pty. Ltd., 422 King William Street, Adelaide, S.A. 5000 (AU).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)* : TAYLOR, Reginald, Morton [AU/AU]; 48 Denning Street, Hawthorn, S.A. 5062 (AU).

(74) Agent: COLLISON & CO.; 117 King William Street, Adelaide, S.A. 5000 (AU).

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(54) Title: TREATMENT OF BURNS

(57) Abstract

Method of treatment of burns and scalds of a human or animal body by application of a pharmaceutically acceptable amount by oral, parenteral of topical application of zinc glycerolate. The application of zinc glycerolate may be as a dry powder, as a cream of applied topically by an applicator.

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TREATMENT OF BURNS

INTRODUCTION

This invention relates to a zinc glycerol complex when used for the treatment of burns and scalds to the human or animal body .

BACKGROUND OF THE INVENTION

The preparation of compounds of glycerol with the transition metals has been described in "*Crystalline cobalt, zinc, manganese and iron alkoxides of glycerol*" by E. W. Radoslovich, M. Raupach, P. G. Slade and R. M. Taylor in Australian Journal of Chemistry 23, 1963 - 1970, (1970). These compounds form during the heating of particular metal oxides, hydroxides or salts with glycerol at temperatures around 120° C or higher. In particular the compound with zinc is of interest. The compound of zinc with glycerol is Zinc (1,2,3 - Propanetriolato [2-] - O_1, O_2) homopolymer, stereoisomer and may be termed zinc monoglycerolate, glycerato zinc, zinc glycerolate and colloquially "glyzinc". The term zinc glycerolate will be used in this specification.

The compound is described for instance in P.C.T. International Publication WO82/01867 in the names of Taylor and Brock, and comprises a specific product of a reaction between certain zinc compounds and glycerol at certain temperature ranges. The compound is described as having uses in the therapeutic or prophylactic treatment of disorders of the human or animal skin. It is suggested that the compound may have cosmetic uses and is suggested for the compounding of shaving cream and as a topical application for the prevention of sunburn.

In WO82/01867 zinc glycerolate is mentioned as having a number of prophylactic and therapeutic uses. Thus it is mentioned as being effective in the treatment and prevention of ammoniacal dermatitis (burns in the genital area of babies which originate from ammonia liberated during the decomposition of urine - nappy rash), in the treatment of pruritus, especially in people confined to bed or immobility, for the alleviation of psoriasis, for the treatment and prevention of fungal or bacteriological decomposition of tissue and the resultant odours arising in such complaints as tinea pedis and for the prevention of industrial dermatitis arising from particular environments.

Reference is also made to P.C.T. International Application WO87/01281 in the name of the present applicant, which unlike the first referred to P.C.T.

application refers to the use of the zinc glycerolate as a per oral treatment for gastric bleeding or ulceration or in a topical application as a depot for the slow release of the compound and refers to diffusion through the skin for the treatment of arthritis and zinc insufficiency and includes psoriasis, and refers also to tests against various organisms including fungi, but does not suggest its beneficial effects ion the condition of or damage to the body set out in this specification nor does it suggest prophylactic treatments which it has now been found to have.

The results in the present invention are as quite unexpected as were the first referred to in the publication of Taylor and Brock where the therapeutic use of the compound was directed to skin irritations and sunburn. In the present invention the condition to be treated involves the destruction or necrosis of epidermal and possibly dermal cells, a condition which can be manifest as an open wound. Therefore it is surprising that zinc glycerolate has been an effective treatment of such conditions and such an expectation could not be gained from the earlier disclosures of the use of zinc glycerolate. Although the discovery was a surprising and unexpected one the observed therapeutic efficacy of an application of this compound to the area of human or animal body damaged by burning so as to cause a destruction of skin cells can be explained by the combination of the physical, chemical and biological properties that this compound has been shown to possess. The compound provides a source of bio-available zinc which is necessary for all cell repair and growth and is especially needed in the skin where 20% of the total zinc content of the body is stored. The compound is also bactericidal or bacteriostatic to the pathogens commonly associated with burns and also the hydrophobic nature of the compound helps to preserve body fluids from loss via the damaged skin.

BRIEF DESCRIPTION OF THE INVENTION

It has been found that zinc glycerolate can be used either by itself or in formulations for the treatment of burns and scalds.

Hence in one form therefore the invention is said to reside in a method of treatment of a human or animal body comprising the step of application of a pharmaceutically acceptable amount by oral, parenteral or topical application of zinc glycerolate for the treatment of burns and scalds.

The term burn will be used to describe burns and scalds caused by hot liquids, solids or gases on human or animal skin.

In a further form the invention is said to reside in the use of zinc glycerolate in a pharmaceutically acceptable amount by oral, parenteral or topical application for the therapeutic treatment of burns and scalds.

In a still further form the invention can be said to reside in zinc glycerolate when used as a pharmaceutical in a pharmaceutically acceptable amount by oral, parenteral or topical application for the therapeutic treatment burns and scalds.

The unsuspected and surprising discovery is that the use of zinc glycerolate as a pharmaceutical appears to provide relief from the symptoms of these conditions and also appears to provide some added advantages in the repair of burned skin.

Application of zinc glycerolate can be topical and can be applied as a dry powder or as a suspension in a suitable liquid medium or semi-solid medium such as a cream or ointment or can be applied topically by an applicator (e.g. by transdermal delivery patches, spray or puffer packs) where internal mobilisation in the blood is required for transport to other internal remote areas. Alternatively it can be applied by parenteral means such as by injection in a suitable suspension or solution. Oral intake in the form of a tablet, capsule or lozenge may also be suitable for some applications of the invention.

One suitable way of treatment might include application as a cream or ointment including in its formulation zinc glycerolate to the affected body part.

It is believed that the action of zinc glycerolate for treatment in the ways as discussed above relates to the ability of the compound to be easily adsorbed into the human or animal body and to release the zinc from within the compound in a form that is readily useable.

Hence unexpectedly it appears that the application of the zinc glycerolate has a beneficial effect in alleviating the symptoms of or treating a number of diseases that are not caused by infection or mechanical injury.

The applicant's have carried out tests to determine the effectiveness of the zinc glycerolate from the conditions and diseases enumerated herein and believe that the results achieved in showing the effectiveness of a compound for treatment of these are entirely unsuspected from the previous disclosures of other prophylactic or therapeutic applications.

Example

Zinc glycerolate in the form of an ointment was applied to cement burns which were fairly extensive and almost deep dermal. The healing response to this treatment was remarkably swift and much quicker than one would expect under normal dressings.

CLAIMS

1. A method of treatment of a human or animal body comprising the step of application of a pharmaceutically acceptable amount by oral, parenteral or topical application of zinc glycerolate for the treatment of burns and scalds.

2. A method of treatment as in Claim 1 wherein the application of zinc glycerolate is selected from the group of topical application, for instance as a dry powder, by suspension in a suitable liquid medium, as a cream or ointment by incorporation into a semi-solid or applied topically by an applicator.

3. A method of treatment as in Claim 1 wherein the application of zinc glycerolate is parenteral means such as by injection in a suitable suspension or solution.

4. A method of treatment as in Claim 1 wherein the application of zinc glycerolate is in the form of a tablet, capsule or lozenge.

5. The use of zinc glycerolate in a pharmaceutically acceptable amount by oral, parenteral or topical application for the for the therapeutic treatment of burns and scalds.

6. Zinc glycerolate when used as a pharmaceutical in a pharmaceutically acceptable amount by oral, parenteral or topical application for the therapeutic treatment of burns and scalds.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU 93/00355

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl.[5] A61K 31/315

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: A61K 31/315

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

AU: IPC as above

Electronic data base consulted during the international search (name of data base, and where practicable, search terms used)

WPAT
JAPIO

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to Claim No.
X	AU,A,62865/86 (GLYZINC PHARMACEUTICALS LIMITED) 12 March 1987 (12.03.87) whole document	1-6
X	WO,A,82/01867 (TAYLOR, Reginald Morton et al) 10 June 1982 (10.06.82) whole document	1-6

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance
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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
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Date of the actual completion of the international search	Date of mailing of the international search report
29 October 1993 (29.10.93)	5 NOV 1993 (5.11.93)
Name and mailing address of the ISA/AU AUSTRALIAN INDUSTRIAL PROPERTY ORGANISATION PO BOX 200 WODEN ACT 2606 AUSTRALIA Facsimile No. (06) 2853929	Authorized officer J.P. PULVIRENTI Telephone No. (06) 2832261

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
AU	62865/86	GB	2191941	JP	63500664	WO	87/01281
WO	82/01867	AU	78032/81	DE	3152555	FR	2494583
		GB	2101132	JP	57501783	JP	2056337
		US	4544761				

END OF ANNEX